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ABSTRACT

A study examined the effect of five types of sentence faults on the method of information processing, recall ability, confidence rating, and comprehensibility rating of college freshman English students. The control text consisted of five passages and the accompanying comprehension questions exactly as they appear on the multiple choice Georgia Regents' Testing Program Reading Test--Form 20. The experimental text consisted of the same five passages and questions, but with five examples of a specific sentence fault embedded in each passage. Procedures for the experimental group were the same. The results indicated that the errors embedded in the experimental passages did cause the readers to pause and retrace their steps more often than did the control passage. The intrusion of sentence faults did not, however, affect the students' ability to answer questions about the passage. The sentence faults did affect both the certainty with which students viewed their understanding of the passages and students' rating of comprehensibility, especially those passages that contained errors in pronoun reference. The findings agree with previous studies indicating a significant relationship between how information is presented on the page and how that information is comprehended by the reader. (HTH)

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REAL READERS AND REAL ERRORS:

A PILOT STUDY

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March 29, 1984

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INTRODUCTION

For the last several decades, critics of public education have decried the lack of preparation of high school graduates for either college or the job market. The back-to-basics movement has led to increased demands for concentrated instruction (i.e. drill) in the fundamentals of math and reading/writing. Invariably, these critics focus on two skill areas--mathematics and language skills--and by language skills they mean reading/writing.

Educators have long assumed that there is a close relationship between reading and writing. For years, reading was defined as a process of reconstructing or decoding a text from alphabetical representations; writing was defined as a process of encoding texts into alphabetical representations. Central to this relationship, then, has been the assumption that precision (or lack of syntactic errors) was important.

The importance of syntactic errors has traditionally been taught from two perspectives. First, syntactic errors are seen as important because they create in the mind of the reader an impression of the writer, and there exists a body of research which supports this assumption. Second, syntactic errors are seen as important because they interfere with the reader's ability to make meaning (reconstruct) from the text. This assumption is less well researched, and the findings are certainly less conclusive.

However, recent interest in the relationship between reading and writing has been more diverse. The basis for a clearly articulated theory of the reading/writing connection has been established by the works of de Beaugrande (1979), Petrosky (1982), Aulls (1975), King and Rentel (1976), Bazerman (1980), and Shanklin (1981). On a more practical level, the work with top-level structuring done by Meyers, et. al. (1980) has emphasized the influence of a writer's organizational pattern on the reader's method of recall. In addition, Birnbaum (1982) has provided valuable insights into the ways readers view themselves as writers, and the ways writers view themselves as readers, as well as providing the groundwork for a methodology documenting how students actually process words from a page.

Developing a methodology for observing students' reading has been central to the concern for documenting the relationship of reader to writer. In addition to Birnbaum, the work by Baker and Brown (1980), as well as that of Winograd and Johnston (1982), on comprehension monitoring has opened new avenues for reading/writing research. Baker and Anderson (1982) have pioneered the use of multiple measures for assessing students' comprehension monitoring skills, specifically the use of confidence ratings and comprehensibility ratings in addition to recall questions. Their work has provided a more precise methodology for observing how readers take print from the page.

Despite the recent theoretical and practical work concerning reading/writing connections, and despite the refinements in methods of observation and measurement of reading ability, only

the work of Burt and Kiparsky (1974) has focused on the effect of syntactic errors on comprehension. Burt and Kiparsky theorized that syntactic errors can be divided into two groups--global and local mistakes. According to them, global mistakes are those that violate rules involving the overall structure of a sentence, the relations among constituent clauses, or, in a simple sentence, the relations among the major constituents. Local mistakes cause trouble in a particular constituent, or in a clause of a complex sentence. In other words, global mistakes are akin to what traditional grammarians refer to as sentence faults; local mistakes more commonly refer to errors in punctuation. The work by Burt and Kiparsky provides some theoretical explanation of the effect of syntax on understanding, but it does not test these hypotheses in a controlled experimental manner.

PROBLEM

This study attempted to determine the effect of five types of sentence faults on the method of information processing, recall ability, confidence rating, and comprehensibility rating of two groups of freshmen English students based on their performances on control and experimental texts of the Regents' Testing Program Reading Test-Form 20. The RTPRT-Form 20 is a multiple choice reading test similar to the comprehension section of the Nelson-Denny Reading Test, and it is used by the University System of Georgia to provide a uniform means of identifying those students who have not attained the minimal level of competence in reading as defined by the Board of Regents.

For purpose of definition, method of information processing

is defined as the degree of linear versus recursive processing as indicated by finger pauses or retracings in the texts. Recall ability is defined as the number of correct answers on a multiple choice comprehension test. Confidence rating is defined as the students' rankings on a Likert Scale of their certainty that their answers are right or wrong; comprehensibility rating is defined as the students' rankings on a Likert Scale of the perceived difficulty of a given text.

REVIEW OF THE LITERATURE

The major portion of the literature on the relationship between syntax and reading comprehension concentrates on reading as a psycholinguistic phenomenon, and its relationship to syntax is limited primarily to the discussion of transformations and deep structures of the language.

Wolfram (1976) is more specific than most of the linguistic literature available. Wolfram suggests that reading difficulties arise from "gaps"--when students do not apply the linguistic ability they have for oral language to reading comprehension. In other words, young children have problems understanding the written page when they fail to recognize that the syntax on the page is like the syntax of daily speech. Wolfram suggests that teachers emphasize the everyday pragmatic usage of language so that students establish for themselves the relationship between oral speech and writing. More specific studies seem to support both the psycholinguistic approach to reading and Wolfram's concept of reading.

Fagan (1971), based on his work with fourth, fifth, and sixth grade basal readers, suggests that teaching language structure as an aid to comprehension would be more effective when taught from the point of view of the transformational-generative model of grammer, since it allows students to see the relationship of spoken language to writing.

O'Donnell (1975), working with fourth, eighth, and eleventh grade students, found that there is a developmental difference in the students' ability to comprehend sentences, but was unable to define the difference based on this data.

Tomiyama (1979), working with ESL (English as a Second Language) students, found that the type of grammatical element omitted affected the students' performances on cloze-type measures of reading comprehension, again suggesting the importance of a grammatical construct to aid comprehension.

Stoodt (1972) found that there is a significant correlation between the ability to identify the relationship which conjunctions signal and the ability to comprehend sentences. Stoodt also found that the conjunction for was more significant in this relationship than the conjunction and.

STATEMENTS OF THE HYPOTHESES

In view of the inconclusive findings of the above studies of the relationship between syntax and reading comprehension, as well as the current work being done in the areas of reading/writing theory, writers' plans, and comprehension monitoring, it was hypothesized that:

1. There will be no significant difference between the method of information processing of the subjects in the control group (control text) and the subjects in the experimental group (experimental text).
2. There will be no significant difference between the recall ability of the subjects in the control group (control text) and the subjects in the experimental group (experimental text).
3. There will be no significant difference between the confidence ratings of the subjects in the control group (control text) and the subjects in the experimental group (experimental text).
4. There will be no significant difference between the comprehensibility ratings of the subjects in the control group (control text) and the subjects in the experimental group (experimental text).

METHOD

Description of Subjects

The sample groups for this study were selected from among 37 college freshmen enrolled in freshman English classes during the spring of 1983. Students who had been previously enrolled in remedial English courses and students who were repeating English 101 were excluded from the study in order to achieve more homongeneity of groups.

Description of the Instrument

The Regents Testing Program Reading Test-Form 20 is a

60-item, multiple-choice test comprised of ten reading passages; each passage is followed by five to eight questions. Administration time for the test is one hour. The test passages range from 175 to 325 words in length; their topics are drawn from a variety of subject areas, including social science, mathematics and natural science, and humanities, and they include examples of various modes of discourse (exposition, narration, and argumentation). The questions which accompany each passage are designed to assess a variety of skills, including using context clues; recognizing details, sequence of events, comparative relationships, cause and effect relationships, and pronoun references; identifying main ideas; reasoning inductively and deductively; interpreting figurative language; and making inferences about the style, purpose, and organization of a passage.

The RTPRT-Form 20 has been found to be both a valid and a reliable measure of reading comprehension by the University System of Georgia Regents Testing Program. Content validity was established by having the passages that were selected for the test and the items that were written to test specifications reviewed first by testing experts for technical soundness and then by a joint committee of English and reading experts from throughout the state. The committee considered whether the passages and questions conformed to the test specifications and whether the content of the passages and questions was appropriate to the target population. Further evidence of validity was gained by correlating the RTPRT-Form 20 and the STEP Reading Form($r = .82$). Reliability based on Kuder Richardson Formula 20

equalled .864; additional KR-20 reliability estimates were calculated for a sample taking both the RTPRT-Form 20 and the STEP Reading Test-Form 1A. For this sample, the KR-20 of the RTPRT-Form 20 was .88, and the KR-20 reliability of the STEP-Form 1A was .89.

For this study, only the first half of the RTPRT-Form 20 was used because the test normally takes sixty minutes to administer, which does not allow administration during a normal class meeting. The control text consisted of five passages and the accompanying comprehension questions exactly as they appear on the RTPRT-Form 20. The students were observed individually, and were asked to follow their reading of the text by moving their fingers across the page as they read. Each time they paused was recorded as an indication of recursiveness. In addition, the students in the control group were asked to answer the comprehension questions, rate their certainty of their answers (from 1-Right Absolutely Sure to 5-Wrong Absolutely Sure), and rate the comprehensibility of each passage (from 1-Easy to Understand to 5-Hard to Understand). The experimental text consisted of the same five passages from the RTPRT-Form 20, each of which had five examples of a specific sentence fault embedded in it. Thus, in Passage 1 there are five sentence fragments; in Passage 2 there are five comma splices and fused sentences; in Passage 3 there are five errors in pronoun reference; in Passage 4 there are five subject-verb agreement errors; in Passage 5 there are five shifts in point of view. The experimental text was administered to the experimental group in precisely the same manner as the control text was administered to the control group.

ANALYSIS OF DATA

Differences between the mean scores on the dependent measures for students in the control group and experimental groups were determined by t-tests. Means were compared for the entire text across all the dependent variables for both groups. In addition, means were compared for each passage across all the dependent variables for both groups.

Method of Information Processing

The obtained t-value for the entire text was significant. In particular, the obtained t-value for the passage which contained errors in pronoun reference was significant. Therefore, Hypothesis 1 is rejected. The errors embedded in the passages did cause the readers to pause and retrace their steps more often than did their counterparts in the control group. The results are presented in Table 1.

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Insert Table 1 here

- -

Recall Ability

Neither the obtained t-value for the entire text nor the t-value for any particular passage was significant. Therefore, Hypothesis 2 is retained. The intrusion of sentence faults did not significantly affect the students' ability to answer questions about the passages. The results are presented in Table 2.

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Insert Table 2 here

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Confidence Ratings

The obtained t-value for the entire text was significant. More specifically, the obtained t-values for passages which included sentence fragments, errors in pronoun reference, errors in subject-verb agreement, and shifts in point of view were significant. These types of sentence faults did significantly affect the surety with which students viewed their understanding of the passages. Therefore, Hypothesis 3 is rejected. The results are presented in Table 3.

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Insert Table 3 here

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Comprehensibility Ratings

The obtained t-value for the entire text was significant. Passage by passage, however, only the obtained t-value for the passage which included errors in pronoun reference was significant. The results are presented in Table 4.

- -

Insert Table 4 here

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CONCLUSIONS

The findings of this study are basically in agreement with previous studies involving reading comprehension and syntax. There is a significant relationship between how information is presented on the page and how that information is comprehended by a reader.

More specifically, students consistently paused and retraced

their steps in reading the passages in the experimental text. This recursiveness was most obvious in the passage involving embedded comma splices and fused sentences. In addition, students were consistently less confident of the correctness of their answers on the experimental text, specifically on the passages involving sentence fragments, errors in pronoun reference, errors in subject-verb agreement, and shifts in point of view. Furthermore, students consistently ranked the experimental text as more difficult to understand than the control text, particularly the passage involving embedded errors in pronoun reference.

Of particular interest here are the results of the multiple choice recall questions. Students in the experimental group did not perform less well on these items than students in the control group. The errors that were embedded in the experimental text were not placed specifically in sentences that contained answers to comprehension questions. An explanation for the test results, then, may lie in the fact that the errors confused the students' overall understanding of the passage, but did not interfere with their ability to process the individual sentences which contained answers to questions when they focused on the passage sentence by sentence. Interesting data might be gathered at a later date by purposely embedding errors in sentences which do contain the answers to the comprehension questions.

In many ways this study raises more questions than it answers, but it does provide interesting new directions for future research. Certainly the effect of the location of embedded

errors within passages is worth pursuing. Studies documenting any correlations between the variables of method of information between the variables of method of information processing, recall ability, confidence of response, and perceived difficulty of reading material would help articulate more precisely the relationship between syntax and reading comprehension. If a hierarchy of errors in terms of importance to meaning making can be delineated, it should be delineated, for certainly that hierarchy should have bearing on grammar instruction in our public schools.

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TABLE 1

METHOD OF INFORMATION PROCESSING

Source	N_c	$\bar{X}_c$	σ_c	N_e	$\bar{X}_e$	σ_e	df	T-value
All Passages	45	4.11	.92	45	4.40	.85	88	5.46*
Passage 1	9	3.88	.57	9	4.00	.66	16	1.02
Passage 2	9	3.88	1.10	9	4.55	.68	16	2.19*
Passage 3	9	4.22	.79	9	4.11	.31	16	.43
Passage 4	9	4.22	.92	9	4.77	.92	16	1.17
Passage 5	9	4.33	1.05	9	4.55	1.17	16	1.21

All Passages $< .001$
Passage 2 $< .05$

Experimental Passage 1--Sentence Fragments
Experimental Passage 2--Comma Splices/Fused Sentences
Experimental Passage 3--Pronoun Reference Errors
Experimental Passage 4--Subject-Verb Agreement Errors
Experimental Passage 5--Shifts in Point of View

TABLE 2

READING RATE

Source	N_c	$\bar{X}_c$	σ_c	N_e	$\bar{X}_e$	σ_e	df	T-value
All Passages	45	309.38	84.53	45	243.00	58.46	88	4.33*
Passage 1	9	273.00	120.93	9	250.78	58.58	16	.50
Passage 2	9	325.44	91.77	9	245.89	63.24	16	2.14*
Passage 3	9	316.56	55.53	9	233.67	55.82	16	3.16*
Passage 4	9	310.89	60.99	9	233.78	46.78	16	3.01*
Passage 5	9	321.00	64.10	9	250.89	63.63	16	2.39*

All Passages	.001	
Passage 2	.05	Experimental Passage 1--Sentence Fragments
Passage 3	.01	Experimental Passage 2--Comma Splices/Fused Sentences
Passage 4	.01	Experimental Passage 3--Pronoun Reference Errors
Passage 5	.02	Experimental Passage 4--Subject-Verb Agreement Errors
		Experimental Passage 5--Shifts in Point of View

TABLE 3

CONFIDENCE RATINGS

Source	N_c	$\bar{X}_c$	σ_c	N_e	$\bar{X}_e$	σ_e	df	T-value
All Passages	270	1.67	.62	300	1.91	.83	568	6.72*
Passage 1	45	1.51	.58	50	1.70	.83	93	2.03*
Passage 2	63	1.79	.69	70	1.93	.90	131	1.79
Passage 3	63	1.59	.63	70	1.96	.87	131	4.61*
Passage 4	45	1.56	.54	50	1.88	.71	93	4.32*
Passage 5	54	1.87	.55	60	2.03	.77	112	2.06*

All Passages	$< .001$	Experimental Passage 1--Sentence Fragments
Passage 1	$< .05$	Experimental Passage 2--Comma Splices/Fused Sentences
Passage 3	$< .001$	Experimental Passage 3--Pronoun Reference Errors
Passage 4	$< .001$	Experimental Passage 4--Subject-Verb Agreement Errors
Passage 5	$< .05$	Experimental Passage 5--Shifts in Point of View

TABLE 4

COMPREHENSIBILITY RATINGS

Source	N_c	$\bar{X}_c$	σ_c	N_e	$\bar{X}_e$	σ_e	df	T-value
All Passages	45	1.88	.85	45	2.27	1.18	88	3.16*
Passage 1	9	1.44	.50	9	1.67	1.05	16	.70
Passage 2	9	2.67	.94	9	2.67	1.25	16	.00
Passage 3	9	1.67	.67	9	2.33	1.05	16	2.30*
Passage 4	9	1.55	.50	9	2.00	.94	16	1.60
Passage 5	9	2.11	.87	9	2.67	1.25	16	1.76

All passages $<.01$
Passage 3 $<.05$

Experimental Passage 1--Sentence Fragments
Experimental Passage 2--Comma Splices/Fused Sentences
Experimental Passage 3--Pronoun Reference Errors
Experimental Passage 4--Subject-Verb Agreement Errors
Experimental Passage 5--Shifts in Point of View

TABLE 5

RECALL ABILITY

Source	N_c	$\bar{X}_c$	σ_c	N_e	$\bar{X}_e$	σ_e	df	T-value
All Passages	9	25.44	2.00	10	23.10	5.70	17	1.24
Passage 1	9	4.77	.42	10	4.00	1.34	17	1.74
Passage 2	9	5.66	.94	10	4.80	1.54	17	1.94
Passage 3	9	6.33	.47	10	6.00	1.18	17	.86
Passage 4	9	4.11	.74	10	3.80	.98	17	1.29
Passage 5	9	4.55	1.26	10	4.50	1.69	17	.12

Experimental Passage 1--Sentence Fragments
Experimental Passage 2--Comma Splices/Fused Sentences
Experimental Passage 3--Pronoun Reference Errors
Experimental Passage 4--Subject-Verb Agreement Errors
Experimental Passage 5--Shifts in Point of View